

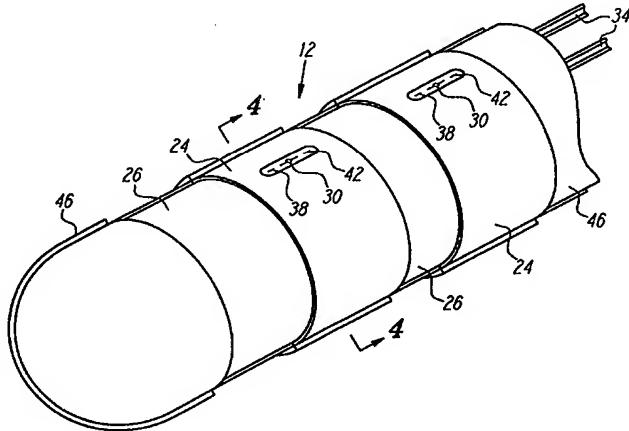


INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ :	A3	(11) International Publication Number:	WO 98/58681
A61L 29/00, A61M 25/00		(43) International Publication Date:	30 December 1998 (30.12.98)

(21) International Application Number:	PCT/US98/12300	(81) Designated States:	AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).
(22) International Filing Date:	12 June 1998 (12.06.98)		
(30) Priority Data:	08/879,343 20 June 1997 (20.06.97)	US	
(71) Applicant:	EP TECHNOLOGIES, INC. [US/US]; 2710 Orchard Parkway, San Jose, CA 95134-2012 (US).		
(72) Inventors:	SWANSON, David, K.; 877 Heatherstone Way #705, Cupertino, CA 95014 (US). YANG, Yi; 2394 45th Avenue, San Francisco, CA 94116 (US). WHAYNE, James, G.; 17930 Los Felice Drive, Saratoga, CA 95070 (US). KOBLISH, Josef, V.; 1055 Manet Street, Sunnyvale, CA 94087 (US).		
(74) Agents:	BURSE, David, T. et al.; Lyon & Lyon LLP, Suite 4700, 633 West Fifth Street, Los Angeles, CA 90071-2066 (US).		
		Published	<i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
		(88) Date of publication of the international search report:	18 March 1999 (18.03.99)

(54) Title: SURFACE COATINGS FOR CATHETERS, DIRECT CONTACTING DIAGNOSTIC AND THERAPEUTIC DEVICES



(57) Abstract

A catheter including a distal end assembly having an external surface coating. Where the distal end assembly includes electrodes or other electrical components, the coating is preferably electrically conductive. Such an electrically conductive coating is formed from a material comprising regenerated cellulose, although other materials such as a hydrogel or a plastic having an electrically conductive component are utilizable. Where the distal end assembly includes optical or ultrasonic components, the regenerated cellulose coating is suitable. The robustness of the surface coating permits the manufacture and utilization of electrode configurations that are formed on a non-conductive base member by processes such as pad printing, vapor deposition, ion beam assisted deposition, electroplating and other printed circuit manufacturing processes. Additionally, because the surface coating produces a smooth outer surface to the distal end assembly, lead wires and temperature sensing devices can be bonded to the exterior surface of electrodes and then coated to produce a smooth outer surface; thus providing a simple, inexpensive manufacturing method for the attachment of such components to the electrodes.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 98/12300

A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A61L29/00 A61M25/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 364 404 A (JAFFE RICHARD B ET AL) 15 November 1994 see claims; figures ---	1
Y	WO 92 20396 A (BRITISH TECH GROUP) 26 November 1992 see claims; figure 1 ---	1-34
P, Y	WO 98 09667 A (KIMBERLY CLARK CO) 12 March 1998 see claims ---	1-34
A	EP 0 346 058 A (ELLIOTT THOMAS STUART JACKSON ;BYRNE PHILLIP OWEN (GB)) 13 December 1989 ---	
A	WO 94 15581 A (UNIV CALIFORNIA) 21 July 1994 -----	

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

25 January 1999

02/02/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

ESPINOSA, M

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/12300

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 5364404	A	15-11-1994	NONE		
WO 9220396	A	26-11-1992	DE 69211849 D		01-08-1996
			DE 69211849 T		24-10-1996
			EP 0584137 A		02-03-1994
			GB 2255721 A, B		18-11-1992
			JP 6507089 T		11-08-1994
			US 5403295 A		04-04-1995
WO 9809667	A	12-03-1998	AU 4063197 A		26-03-1998
EP 0346058	A	13-12-1989	DE 68911389 D		27-01-1994
			DE 68911389 T		14-04-1994
			GB 2219510 A, B		13-12-1989
			JP 2046866 A		16-02-1990
			JP 2790316 B		27-08-1998
			US 5154165 A		13-10-1992
WO 9415581	A	21-07-1994	US 5334394 A		02-08-1994
			US 5441739 A		15-08-1995
			AU 5600994 A		15-08-1994
			AU 5726694 A		15-08-1994
			AU 6955494 A		15-08-1994
			CA 2152379 A		21-07-1994
			CA 2152490 A		21-07-1994
			EP 0689421 A		03-01-1996
			EP 0676954 A		18-10-1995
			EP 0676955 A		18-10-1995
			JP 8505788 T		25-06-1996
			JP 8505387 T		11-06-1996
			JP 9504265 T		28-04-1997
			US 5306508 A		26-04-1995
			WO 9415585 A		21-07-1994
			WO 9415586 A		21-07-1994
			US 5460830 A		24-10-1995
			US 5462751 A		31-10-1995
			US 5460831 A		24-10-1995
			US 5464634 A		07-11-1995
			US 5639505 A		17-06-1997